

REMARKS

The above amendments are made in response to the Office action of March 18, 2009. The Examiner's reconsideration is respectfully requested in view of the above amendments and the following remarks. No new matter has been added, amendments have been made for purposes of clarifying the claimed invention.

Claims 1-17 are pending in the present application. Claims 1 and 3-17 have been amended and claim 2 has been canceled. Support for the amendments can at least be found in original claims 1-17, and in the entire disclosure of the originally filed specification. Therefore, claims 1 and 3-17 are pending for consideration by the Examiner upon entry of the present Amendment.

Applicants respectfully submit that the claims as presented are in condition for allowance.

Specification

The specification at page 15, line 7 is objected to for various informalities. In light of the Examiner's comments, the paragraph of the specification beginning at page 15, line 4 has been amended.

Applicants respectfully request that in view of the amendments to the specification the objections to the specification be withdrawn.

Claim Objections

The Examiner objects to claims 13, 14, 15 and 16 for various informalities. Specifically, the Examiner objects to claims 13, 14 and 16 because the phrase "and/or" renders the claims indefinite. The Examiner objects to claim 15 for lacking a period at the end of the claim sentence.

By this Amendment, claims 13-16 have been amended in accordance with the Examiner's comments. Accordingly, reconsideration and withdrawal of the objection are respectfully requested.

Rejections Under 35 U.S.C. § 112

Claims 1-17 stand rejected under 35 U.S.C. § 112, second paragraph as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. By this amendment, the subject matter of dependent claim 2 has been incorporated into independent claim 1 and claim 2 has been canceled.

Specifically, the Examiner rejects claim 1 for reciting, “the average transition metal” in lines 4-5 because the phrase lacks proper antecedent basis and because the specification lacks a standard for ascertaining the requisite degree. *See* Office action at page 4. By this Amendment, claim 1 has been amended in view of the Examiner’s comments.

The Examiner rejects claims 2-8, 11-12 and 16 as being incomplete for omitting the essential element “z,” such omission amounting to a gap between the elements. *See* Office action at page 4. By this Amendment, claims 3-8, 11-12 and 16 have each been amended to delete the element “z.” Applicants respectfully assert that “z” is not an element that is essential to the formula. Support for the amendment can at least be found in the originally filed specification at page 1, line 20 through page 2, line 2; page 8 lines 18-26 and in Example 3.3.1 on page 31.

The Examiner further asserts that claims 2-5 and 7-17 are indefinite based upon their dependency from claims 1 and 6. In view of the amendments to claims 1 and 6, Applicants respectfully submit that claims 3-5 and 7-17 are no longer indefinite based upon their dependency thereon.

In light of the above remarks and amendments it is respectfully requested that the Examiner reconsider the rejection of claims 1 and 3-17 under 35 U.S.C. §112, second paragraph.

Rejections Under 35 U.S.C. § 103

In order for an obviousness rejection to be proper, the Examiner must meet the burden of establishing that all elements of the invention are disclosed in the prior art; that the prior art relied upon, coupled with knowledge generally available in the art at the time of the invention, must contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or combined references; and that the proposed modification of the prior art must have had a reasonable expectation of success, determined from the vantage point of the

skilled artisan at the time the invention was made. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988); *In re Wilson*, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970); *Amgen v. Chugai Pharmaceuticals Co.*, 927 U.S.P.Q.2d, 1016, 1023 (Fed. Cir. 1996). See MPEP 2143.

Establishing a prima facie case of obviousness requires that all elements of the invention be disclosed in the prior art. *In re Wilson*, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970). Further, even assuming that all elements of an invention are disclosed in the prior art, an Examiner cannot establish obviousness by locating references that describe various aspects of a patent applicant's invention without also providing evidence of the motivating force which would have impelled one skilled in the art to do what the patent applicant has done. *Ex parte Levengood*, 28 U.S.P.Q. 1300 (Bd. Pat. App. Int. 1993). The references, when viewed by themselves and not in retrospect, must suggest the invention. *In re Skill*, 187 U.S.P.Q. 481 (C.C.P.A. 1975).

Claims 1-17

Claims 1-8 and 17 stand rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Lampe-Onnerud, et al. (U.S. Patent Publication No. 2002/0192552; hereinafter, "Lampe-Onnerud"). Claims 9-16 stand rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Lampe-Onnerud in view of Fierro, et al. (U.S. Patent No. 6,416,903; hereinafter, "Fierro"). Because the rejections are related, they are addressed together. By this amendment, the subject matter of dependent claim 2 has been incorporated into independent claim 1 and claim 2 has been canceled. Applicants respectfully traverse the rejection.

Regarding independent claims 1 and 6, the Examiner states that Lampe-Onnerud discloses all of the limitations of the above-mentioned claims. *See* Office action at page 8. Regarding dependent claims 9-16, the Examiner states that Lampe-Onnerud discloses all of the limitations of the above-mentioned claims except, *at least one solution of dissolved hydroxide of carbonate salts added to particles acting as seeds*, which the Examiner alleges is disclosed primarily in Fierro. *See* Office action at pages 8-9. Applicants respectfully disagree.

Amended independent claim 1 recites, *inter alia*:

"A powdery transition metal compound comprising:

at least 85 % w/w of transition metal and oxygen,

wherein the powder includes particles, which have a significant spatial change of

transition metal stoichiometry, **having an average transition metal composition $M=(Mn_{1-u}Ni_u)_{1-y}Co_y$ where $0.2 < u < 0.7$ and $0.1 < y < 0.9$,**

wherein the average transition metal composition of cobalt as well as manganese as well as nickel in the outer bulk differ by at least 10% in stoichiometry from the average transition metal composition of the inner bulk,

the inner bulk being specified as a region around the center of the particle including about 50% of the total number of cobalt, nickel and manganese atoms of the particle.” (*Emphasis Added*).

In addition, amended independent claim 6 recites, *inter alia*:

“A powderous lithium metal oxide, wherein at least 90% of the metal is transition metal with an average transition metal composition $M=(Mn_{1-u}Ni_u)_{1-y}Co_y$ where $0.4 < u < 0.65$ and $0.2 < y < 0.9$,

the powder consisting of particles which have

- the same layered crystal structure with space group $r-3m$ everywhere in the bulk of typical particles
- a significant spatial change of transition metal stoichiometry, where the average transition metal compositions of cobalt as well as manganese as well as nickel in the outer bulk differ by at least 10% in stoichiometry from the average transition metal compositions of the inner bulk,

the inner bulk being specified as a region around the center of the particle including about 50% of the total number of cobalt, nickel and manganese atoms of the particle.” (*Emphasis Added*).

The Examiner asserts that Lampe-Onnerud discloses a core material having the claimed empirical formula. *See* Office action at pages 6-7. Applicants respectfully disagree. At most, Lampe-Onnerud describes a core material having an empirical formula $Li_xM'_zNi_{1-y}M''_yO_2$ where “x” is equal to or greater than about 0.1 and equal to or less than about 1.3; “y” is greater than about 0.0 and equal to or less than about 0.5; and “z” is greater than about 0.0 and equal to or less than about 0.2 (Lampe-Onnerud, Abstract). In this formula, M’ is at least one member of

the group consisting of sodium, potassium, nickel, calcium, magnesium and strontium; and M'' is at least one member of the group consisting of cobalt, iron, manganese, chromium, vanadium, titanium, magnesium, silicon, boron, aluminum and gallium (Lampe-Onnerud, Abstract).

In contrast, according to the presently claimed invention, the averaged compositions of the transition metals in the outer bulk differ by at least 10% in stoichiometry from the averaged compositions of the transition metals of the inner bulk, which is not disclosed in Lampe-Onnerud.

In addition, the average transition metal composition M in the presently claimed invention is $M=(Mn_{1-u}Ni_u)_{1-y}Co_y$, wherein $0.2 < u < 0.7$ and $0.1 < y < 0.9$. Furthermore, the averaged compositions of transition metals in the outer bulk and the averaged compositions of transition metals in the inner bulk differ by at least 10%. Therefore, in amended claims 1 and 6, the maximum stoichiometry of Ni is 0.63, since $0.7 - (0.1 * 0.7) = 0.63$ and therefore the maximum overall stoichiometry of Ni is less than 0.63 since $0.1 < y < 0.9$. In addition, in amended claims 1 and 6, the maximum stoichiometry of Mn is 0.72, since $(1-0.2) - (0.1 * (1-0.2)) = 0.72$ and thus the maximum overall stoichiometry of Mn is less than 0.72 since $0.1 < y < 0.9$. Therefore, if the amount of Ni is less than 0.63 then the sum of Mn and Co is necessarily more than 0.37. However, in Lampe-Onnerud, the mole ratio of Ni is always more than 0.6, and the sum of Mn and Co is less than 0.2 in both in the core and in the coating.

Lampe-Onnerud thus fails to disclose, teach or likewise suggest: **an average transition metal composition $M=(Mn_{1-u}Ni_u)_{1-y}Co_y$ where $0.2 < u < 0.7$ and $0.1 < y < 0.9$, wherein the average transition metal composition of cobalt as well as manganese as well as nickel in the outer bulk differ by at least 10% in stoichiometry from the average transition metal composition of the inner bulk**, as claimed in amended claim 1. Lampe-Onnerud further fails to disclose, teach or likewise suggest: **an average transition metal composition $M=(Mn_{1-u}Ni_u)_{1-y}Co_y$ where $0.4 < u < 0.65$ and $0.2 < y < 0.9$, wherein a significant spatial change of transition metal stoichiometry, wherein the average transition metal composition of cobalt as well as manganese as well as nickel in the outer bulk differ by at least 10% in stoichiometry from the average transition metal composition of the inner bulk**, as claimed in amended claim 6. Accordingly, at the time of the invention, Lampe-Onnerud would have rendered obvious amended independent claims 1 and 6.

Fierro is cited only against dependent claims 9-16 for the purposes of disclosing, *at least one solution of dissolved hydroxide of carbonate salts added to particles acting as seeds.*

However, nowhere does Fierro disclose, teach or likewise suggest: **an average transition metal composition $M=(Mn_{1-u}Ni_u)_{1-y}Co_y$ where $0.2 < u < 0.7$ and $0.1 < y < 0.9$, wherein the average transition metal composition of cobalt as well as manganese as well as nickel in the outer bulk differ by at least 10% in stoichiometry from the average transition metal composition of the inner bulk**, as claimed in amended claim 1. Fierro further fails to disclose, teach or likewise suggest: **an average transition metal composition $M=(Mn_{1-u}Ni_u)_{1-y}Co_y$ where $0.4 < u < 0.65$ and $0.2 < y < 0.9$, wherein a significant spatial change of transition metal stoichiometry, wherein the average transition metal composition of cobalt as well as manganese as well as nickel in the outer bulk differ by at least 10% in stoichiometry from the average transition metal composition of the inner bulk**, as claimed in amended claim 6. Accordingly, at the time of the invention, no combination of Lampe-Onnerud and Fierro would have rendered obvious amended independent claims 1 and 6.

Thus, Applicants respectfully submit that neither of Lampe-Onnerud or Fierro, nor use of routine skill in the art, either alone or in any combination, would have rendered obvious the subject matter of amended independent claims 1 and 6. Claims 3-5 and 7-17 variously depend from independent claims 1 and 6, and therefore include the allowable elements of independent claims 1 and 6. It is thus believed that claims 3-5 and 7-17 are patentable over Lampe-Onnerud and Fierro for at least the reasons given above for independent claims 1 and 6.

Accordingly, it is respectfully submitted that the claimed invention is allowable over the combined disclosure of Lampe-Onnerud and Fierro. The Examiner's withdrawal of the rejection of claims 1 and 3-17, and their subsequent allowance are respectfully requested.

Conclusion

In light of the above remarks, the present application including claims 1 and 3-17 are believed to be in condition for allowance.

Applicants hereby petition for any necessary extension of time required under 37 C.F.R. 1.136(a) or 1.136(b) which may be required for entry and consideration of the present Reply.

Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw the outstanding rejections. If there are any charges due with respect to this response, please charge them to Deposit Account No. 06-1130 maintained by Applicants' Attorneys.

Respectfully submitted,

CANTOR COLBURN LLP

By /Jennifer L. Riley/
James J. Merrick
Reg. No. 43,801
Jennifer L. Riley
Reg. No. 64,315
Confirmation No. 6703
Cantor Colburn LLP
20 Church Street, 22nd Floor
Hartford, CT 06103
PTO Customer No. 23413
Telephone: (860) 286-2929
Fax: (860) 286-0115

Date: September 18, 2009